

QUIZ

EVALUATOR

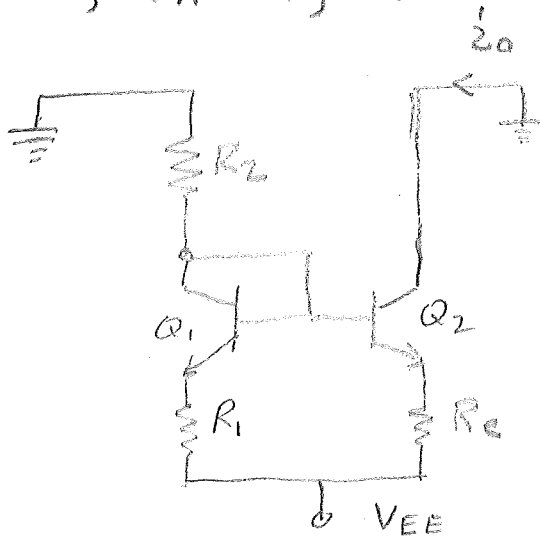
NO Calculators

Sep 30th 2011

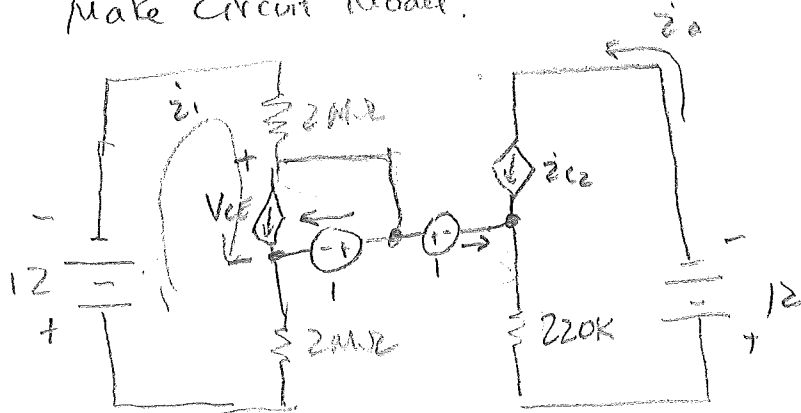
Solution Guide

NAME

What is the output current of the current source,
where, $V_A = \infty$, $V_{EE} = -12V$, $R_1 = 2M\Omega$, $R_2 = 2M\Omega$,
 $R_E = 220K\Omega$, $\beta_{FO} = 100$,
 $V_{BE} = 1V$



Make Circuit Model:



- ① Assume $Q_1 = Q_2$
 $\therefore V_{BE1} = V_{BE2}$
 $\therefore i_{c1} = i_{c2}$ +3

$$i_{c2} = \beta_{FO} i_{B2} \leq +1$$

- ② KVL left loop +4

- ③ Solve for i_{B1} +1

$$i_{B2} = i_{B1}$$

$$i_o = \beta_F i_{B1} \quad +1$$

$$+12 + 2M\Omega i_1 + V_{CE} + i_e \cdot 2M\Omega = 0$$

$$i_1 = i_{c1} + i_{B1} + i_{B2} = i_{c1} + 2i_B$$

$$-12 = 2M\Omega (2i_{B1} + i_{c1}) + V_{BE} + (i_B + i_{c1}) 2M\Omega$$

10pts

Points

proper ckt model OR proper loop and
+5